

## Computer Program Listing Appendix A

1 Text string resources used for expert system:  
2 Project/Fabric Strings:  
3   IDS\_PROJECT   "No Project type selected."  
4   IDS\_COTTON   "Ordinary cotton, polyester, or blends embroider easily."  
5   IDS\_COTTON/POLYESTER   "Ordinary cotton, polyester, or blends embroider easily. If you are working with a heavy weight, also  
6 check out the instruction for Canvas/Denim. Since this category covers a broad range of fabrics, let's just add that you don't want to stretch  
7 the fabric itself. this will cause compensation problems; your colors may not register well. Always try to get the fabric stable before hooping  
8 it to eliminate this problem. When hooping, remember to make sure the fabric is 'drum tight'."  
9   IDS\_CANVAS/DENIM   "Canvas and denim are generally easy to embroider and don't require a lot of stabilizer."  
10   IDS\_FLEECE   "Fleece is wonderful to embroider."  
11   IDS\_HATS   "Hats that are structured have stabilizer built-in. You may not have to use much stabilizer. The trouble is hooping; the hat  
12 won't press into the frame easily. Alignment takes practice."  
13   IDS\_HATU   "Hats that are not structured require a little extra stabilization. They are less difficult to embroider than structured hats, but  
14 can still be difficult."  
15   IDS\_HOSIERY   "Hosiery, stockings, etc., can be embroidered! This project is unusual because we actually stretch the material for a change!  
16 Be very careful not to get other parts of the stocking caught! (It will probably happen the first time you try this type of  
17 embroidery.)"  
18   IDS\_JERSEY   "Sweatshirt or jersey material can be difficult because of its tendency to shrink under the tension of embroidery. Due to  
19 this, stabilization is very important. Do not attempt to pull the fabric tight in the hoop as this makes the problem very bad.  
20 Just make sure that the stabilizer is hooped tightly, with the fabric adhered to it in a 'relaxed' state."  
21   IDS\_LACE   "Using lace designs is easy if you use a net or tulle as a foundation and some water-soluble stabilizer adhered well to it. You  
22 may want to use self-adhesive water-soluble stabilizer. If you do, hoop the stabilizer, expose some of the sticky area, and  
23 press the net onto it."  
24   IDS\_LEATHER   "Leather is fairly stable, but will stretch as you hoop it, therefore use an iron-on stabilizer. Split leather (garment-weight)  
25 will fit into your hoop. Some leathers, however, are too heavy."  
26   IDS\_LINEN   "Linens sews out like most cotton or polyester fabrics, however it typically is a loose weave, so be careful not to stretch the  
27 fabric, particularly on the bias."  
28   IDS\_LYCRA   "Lyra and other 'super-stretch' fabrics can be surprisingly easy. The difficulty lies in approximating the amount of stretch  
29 the fabric will endure, because that's the amount of stretch that gets applied during the hooping process."  
30   IDS\_METAL   "Metal work or copper-punch is neat if you have a design digitized for it. Remember that every 'stitch' will leave a hole  
31 when you are digitizing for this process. Since it is unlikely that your metal plate will be hoop-able, put some self-adhesive  
32 stabilizer in the hoop and expose just enough stickiness to be sure that your metal won't shift. When you're done, release the  
33 stabilizer from the hoop and have some solvent on hand to remove the adhesive that's left behind. If you do this carefully,  
34 you'll have no bends in your metal!"  
35   IDS\_MICROTEX   "We've been seeing these high-density fabrics recently, and they have their uses, but you must first remember that they have  
36 needle problems: Use a sharp (microtex) needle. In a pinch, a leather or denim needle will do."  
37   IDS\_QUILTED   "Quilted material is easy to embroider because in a sense it is already stable. One thing is important though; use a tear-away  
38 stabilizer on the back so that the texture of the back won't snag as it embroiders."  
39   IDS\_SATIN   "Satin sews easily and is easily stabilized. The real difficulty is hooping this fabric (it can be very slippery). If your satin is  
40 made of acetate, remember that water will leave spots, so we don't advise water-soluble stabilizer, and check your iron/press  
41 before pressing."  
42   IDS\_PIQUE   "The typical sports shirt is made of a very breathable fabric known as a pique knit. This fabric also moves easily over the  
43 body. What this also means is that it will pull-in after embroidering if you're not careful! Although it is not likely to stretch  
44 much, pique knit wants to be treated as if it would. Relax the fabric as much as possible before stabilizing. You may also  
45 want to lower your tension slightly (Only slightly). If you have a bunch of shirts to do, practice on a sample first."  
46   IDS\_SILK   "Silk is wonderful to embroider, but use a sharp (microtex) needle. Be careful not to stretch on the bias when tightening the  
47 hoop."

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48 IDS\_BATH "Bath towels are very heavy, the result of which is that designs may lose some detail. However, towels are fairly easy to  
49 embroider. You can even make a two-sided towel by matching your bobbin thread. Hoop a heavy water-soluble, then use  
50 spray-adhesive to attach the towel to the stabilizer."  
51 IDS\_HAND "Hand towels are less heavy than bath towel, and the odds are that you can hoop it."  
52 IDS\_VELVET "Velvet can be difficult, but yields wonderful results! Test to see if hooping your velvet will crush it. Also test for water-  
53 marks, if you're inclined to use a water-soluble stabilizer on top to stabilize the nap of the fabric."  
54 IDS\_VINYL "Vinyl can be embroidered, but the catch is to use a good stabilizer underneath. The reason is that vinyl can be literally  
55 cut-out if the density of the stitches is high. By using a good cut-away, or perhaps even another layer of fabric, you will  
56 actually be sewing the vinyl onto the underlaying material, which helps a lot. Use a leather needle (jeans needle in a pinch)  
57 to keep the holes as small as possible."  
58 IDS\_WOOL "Wool is wonderful to embroider, but be careful if it has a pile or a stretch. Wools today are blended with many other  
59 fabrics, so this will require some attention."  
60 **General Purpose String resources:**  
61 IDS\_NEEDLEINFO "The following are my needle recommendations:  
62 IDS\_HOOPINFO "The following are my hooping recommendations:  
63 IDS\_STABILIZERINFO "The following are my stabilizer recommendations:  
64 IDS\_STANDARD "No stock answer"  
65 **Hooping resources:**  
66 IDS\_NOHOOP "Tightly hoop a self-adhesive tear-away stabilizer without removing the lining paper. Use a sharp knife or seam ripper to  
67 score a large section of the lining paper and peel it away, exposing the sticky surface. Carefully press your fabric into  
68 position. The more times you have to try to re-align it, the less sticky stuff you'll have."  
69 IDS\_NOHOOPSOLVY "Add a layer of water-soluble stabilizer to the top of the fabric. You may want to use a little spray adhesive to hold it in  
70 place."  
71 IDS\_NOHOOPBASTE "With your design stabilized, embroider a basting stitch to help further anchor the stabilizer and fabric together. To create a  
72 basting stitch, use the 'Auto Baste' feature in Designer's Gallery."  
73 **Stabilization resources:**  
74 IDS\_NOWATER "Be careful using water-soluble stabilizer on this fabric. Test thoroughly!"  
75 IDS\_NOHEAT "If you use a stabilizer that dissolves with heat, be careful. If there is any nylon in your fabric, you must keep the heat low."  
76 IDS\_NORMAL "Use a self-adhesive tear away stabilizer, cut big enough to fit the hoop."  
77 IDS\_IRONON "Or, better yet, use an iron-on stabilizer."  
78 IDS\_CUTAWAY "Or, better still, use a cut-away stabilizer."  
79 IDS\_TEARAWAY "Or, better still, use a tear-away stabilizer."  
80 IDS\_HEAVYSOLVY "Also add a layer of heavy water-soluble stabilizer to the top (Some of these are now available as self-adhesive  
81 too!)"  
82 IDS\_CLEARMELT "A handy alternative to water-soluble stabilizers are those that 'melt' away with heat."  
83 IDS\_MODSTRETCH "Since you have increased the stretch setting, it is probable that you want to use a better-adhered stabilizer. Also, remember  
84 to tighten the stabilizer, not the fabric, in the hoop."  
85 **Other String Resources:**  
86 IDS\_RETURN "  
87 IDS\_MODSTRETCHNONE "Hypothetical question: How does that exist without stretch?"  
88 IDS\_MODSTRETCHMETAL "By the way, how does metal have stretch?"  
89 **Needle and Thread String resources:**  
90 NDL\_LEATHER "Needle: Leather, size 14"  
91 NDL\_JEANS "Needle: Jeans, size 14"  
92 NDL\_EMBROIDERY "Needle: Embroidery, size 14"  
93 NDL\_EMBROIDERY "Needle: Embroidery, size 11-12"  
94 NDL\_EMBSMALL "Needle: Embroidery, size 11"  
95 NDL\_STRETCH "Needle: Stretch, size 12"  
96 NDL\_UNIBIG "Needle: Universal, size 18"

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97 NDL_MICROTEX    "Needle: Microtex, size 11-12"
98 IDS_40WT        "Thread: 40wt."
99 IDS_35WT        "Thread: 35wt."
100 IDS_30WT       "Thread: 30wt."
101 IDS_50WT        "Thread: 50wt."
102 IDS_NOTHREAD   "No Thread"
103 Project String table indexes
104 IDS_SETTING     "No setting"
105 IDS_SCOTTON    "000"
106 IDS_SCANVAS    "340"
107 IDS_SFLEECE    "311"
108 IDS_SHATS      "340"
109 IDS_SHAT       "300"
110 IDS_SHOSIERY   "222"
111 IDS_SJERSEY    "011"
112 IDS_SLACE      "221"
113 IDS_SLEATHER   "351"
114 IDS_SLINEN     "110"
115 IDS_SLYCRA     "142"
116 IDS_SMETAL     "450"
117 IDS_SMICROTEX  "150"
118 IDS_SQUILTED   "400"
119 IDS_SSATIN     "100"
120 IDS_SPIQUE     "111"
121 IDS_SSILK      "140"
122 IDS_SBATH      "440"
123 IDS_SHAND      "340"
124 IDS_SVELVET    "341"
125 IDS_SVINYL     "450"
126 IDS_SWOOL      "340"
127 void CStabAdvDlg::Recommend()
128 { // Start with a clean slate:
129     rec = "";
130     recList.RemoveAll();
131     // Display info on project.
132 Sample Code Functions for Analysis Software
133     recList.AddTail(RecList(IDS_COTTON + m_project));
134     // Create the MustBePriorTo list.
135     // Create the MustFollow list.
136     // Add the needle and thread recommendations
137     if(IsInList(IDS_COTTON)) { m_needle.LoadString(NDL_EMBROIDERY);
138     if(IsInList(IDS_CANVAS)) { m_needle.LoadString(NDL_JEANS);
139     if(IsInList(IDS_FLEECE)) { m_needle.LoadString(NDL_EMBROIDERY);
140     if(IsInList(IDS_HATS)) { m_needle.LoadString(NDL_EMBROIDERY);
141     if(IsInList(IDS_HATU)) { m_needle.LoadString(NDL_EMBROIDERY);
142     if(IsInList(IDS_HOSIERY)) { m_needle.LoadString(NDL_EMBSMALL);
143     if(IsInList(IDS_JERSEY)) { m_needle.LoadString(NDL_STRETCH);
144     if(IsInList(IDS_LACE)) { m_needle.LoadString(NDL_EMBROIDERY);
145     if(IsInList(IDS_LEATHER)) { m_needle.LoadString(NDL_LEATHER);
146
147     m_thread.LoadString(IDS_40WT); }
148     m_thread.LoadString(IDS_35WT); }
149     m_thread.LoadString(IDS_30WT); }
150     m_thread.LoadString(IDS_40WT); }
151     m_thread.LoadString(IDS_40WT); }
152     m_thread.LoadString(IDS_40WT); }
153     m_thread.LoadString(IDS_35WT); }
154     m_thread.LoadString(IDS_30WT); }

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146 if(IsInList(IDS_LINEN)) { m_needle.LoadString(NDL_EMBROIDERY);
147 if(IsInList(IDS_LYCRA)) { m_needle.LoadString(NDL_EMBROIDERY);
148 if(IsInList(IDS_METAL)) { m_needle.LoadString(NDL_UNIBIG);
149 if(IsInList(IDS_MICROTEX)) { m_needle.LoadString(NDL_MICROTEX);
150 if(IsInList(IDS_QUILTED)) { m_needle.LoadString(NDL_EMBROIDERY);
151 if(IsInList(IDS_SATIN)) { m_needle.LoadString(NDL_MICROTEX);
152 if(IsInList(IDS_PIQUE)) { m_needle.LoadString(NDL_EMBROIDERY);
153 if(IsInList(IDS_SILK)) { m_needle.LoadString(NDL_MICROTEX);
154 if(IsInList(IDS_BATH)) { m_needle.LoadString(NDL_JEANS);
155 if(IsInList(IDS_HAND)) { m_needle.LoadString(NDL_EMBROIDERY);
156 if(IsInList(IDS_VELVET)) { m_needle.LoadString(NDL_EMBROIDERY);
157 if(IsInList(IDS_VINYLL)) { m_needle.LoadString(NDL_LEATHER),
158 if(IsInList(IDS_WOOL)) { m_needle.LoadString(NDL_EMBROIDERY);
159 // Create the stabilizer advise
160 if(!recList.IsEmpty())
161 {
162     //recList.AddTail(RecList(IDS_STABILIZERINFO));
163     if(IsInList(IDS_COTTON)) recList.AddTail(RecList(IDS_NORMAL));
164     if(IsInList(IDS_COTTON/POLYESTER)) recList.AddTail(RecList(IDS_NORMAL));
165     if(IsInList(IDS_CANVAS)) recList.AddTail(RecList(IDS_NORMAL));
166     if(IsInList(IDS_FLEECE)) recList.AddTail(RecList(IDS_NORMAL));
167     if(IsInList(IDS_HATS)) recList.AddTail(RecList(IDS_NOHOOP));
168     if(IsInList(IDS_HATU)) recList.AddTail(RecList(IDS_NOHOOP));
169     if(IsInList(IDS_HOSIERY)) recList.AddTail(RecList(IDS_NOHOOP));
170     if(IsInList(IDS_JERSEY))
171     {
172         recList.AddTail(RecList(IDS_NORMAL));
173         recList.AddTail(RecList(IDS_CUTAWAY));
174     }
175     //if(IsInList(IDS_LACE)) recList.AddTail(RecList(IDS_NORMAL));
176     if(IsInList(IDS_LEATHER)) recList.AddTail(RecList(IDS_NOHOOP));
177     if(IsInList(IDS_LINEN))
178     {
179         recList.AddTail(RecList(IDS_NORMAL));
180         recList.AddTail(RecList(IDS_IRONON));
181     }
182     if(IsInList(IDS_LYCRA))
183     {
184         recList.AddTail(RecList(IDS_NORMAL));
185         recList.AddTail(RecList(IDS_NOHOOPBASTE));
186         recList.AddTail(RecList(IDS_NOHEAT));
187     }
188     //if(IsInList(IDS_METAL)) recList.AddTail(RecList(IDS_NORMAL));
189     if(IsInList(IDS_MICROTEX)) recList.AddTail(RecList(IDS_NORMAL));
190     if(IsInList(IDS_QUILTED)) recList.AddTail(RecList(IDS_NORMAL));
191     if(IsInList(IDS_SATIN))
192     {
193         recList.AddTail(RecList(IDS_CLEARMELT));
194         recList.AddTail(RecList(IDS_NORMAL));
195         recList.AddTail(RecList(IDS_IRONON));
196     }
197     if(IsInList(IDS_PIQUE))
198     {
199         recList.AddTail(RecList(IDS_NORMAL));
200         recList.AddTail(RecList(IDS_CUTAWAY));
201         recList.AddTail(RecList(IDS_HEAVYSOLVY));
202         recList.AddTail(RecList(IDS_NOHOOPBASTE));
203     }
204     if(IsInList(IDS_SILK)) recList.AddTail(RecList(IDS_NORMAL));
205     if(IsInList(IDS_BATH))
206     {
207         m_thread.LoadString(IDS_40WT);
208         m_thread.LoadString(IDS_40WT);
209         m_thread.LoadString(IDS_NOTHREAD);
210         m_thread.LoadString(IDS_50WT);
211         m_thread.LoadString(IDS_40WT);
212         m_thread.LoadString(IDS_40WT);
213         m_thread.LoadString(IDS_40WT);
214         m_thread.LoadString(IDS_50WT);
215         m_thread.LoadString(IDS_30WT);
216         m_thread.LoadString(IDS_35WT);
217         m_thread.LoadString(IDS_40WT);
218         m_thread.LoadString(IDS_30WT);
219         m_thread.LoadString(IDS_35WT);
220     }
221 }
222 }

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195     {   recList.AddTail(RecList(IDS_NOHOOPSOLVY));
196         recList.AddTail(RecList(IDS_NOHOOPBASTE));    }
197     if(IsInList(IDS_HAND))
198     {   recList.AddTail(RecList(IDS_NORMAL));
199         recList.AddTail(RecList(IDS_NOHOOPSOLVY));
200         recList.AddTail(RecList(IDS_NOHOOPBASTE));    }
201     if(IsInList(IDS_VELVET))
202     {   recList.AddTail(RecList(IDS_CLEARMELT));
203         recList.AddTail(RecList(IDS_NOHEAT));
204         recList.AddTail(RecList(IDS_NORMAL));           }
205     //if(IsInList(IDS_VINYL)) recList.AddTail(RecList(IDS_NORMAL));
206     if(IsInList(IDS_WOOL))
207     {   recList.AddTail(RecList(IDS_NORMAL));
208         recList.AddTail(RecList(IDS_NOHOOPSOLVY));    }
209 } // if(!recList.IsEmpty())
210 // Create the stabilizer MustBePriorTo list.
211 // Create the stabilizer MustFollow list.
212 Sample Code Function for Operator Parameter Selection
213 // Use rules to modify based on users changing settings.
214 if(!IsInList(IDS_METAL) && (tStretch < m_stretch)) // Stretch increased
215 {
216     recList.AddTail(RecList(IDS_RETURN));
217     recList.AddTail(RecList(IDS_RETURN));
218     recList.AddTail(RecList(IDS_MODSTRETCH));
219 }
220 if(IsInList(IDS_COTTON))
221 {
222     if(m_thickness > 2) m_needle.LoadString(NDL_JEANS); }
223 if(IsInList(IDS_COTTON/POLYESTER))
224 {
225     if(m_thickness > 2) m_needle.LoadString(NDL_JEANS);   }
226 if(IsInList(IDS_CANVAS))
227 {
228     if(m_thickness < 3) m_needle.LoadString(NDL_EMBROIDERY); }
229 if(IsInList(IDS_FLEECE))
230 {
231     if(IsInList(IDS_HATS))
232     {
233         if(!m_stretch)
234         {
235             recList.AddTail(RecList(IDS_RETURN));
236             recList.AddTail(RecList(IDS_RETURN));
237             recList.AddTail(RecList(IDS_MODSTRETCHNONE)),
238         }
239     }
240     if(IsInList(IDS_JERSEY))
241     {
242     }
243     if(IsInList(IDS_LACE))
244     {
245     }
246     if(IsInList(IDS_LEATHER))
247     {
248     }

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```
244 if(IsInList(IDS_LINEN))
245 {
246 if(IsInList(IDS_LYCRA))
247 {
248     if(!m_stretch)
249     {
250         recList.AddTail(RecList(IDS_RETURN));
251         recList.AddTail(RecList(IDS_RETURN));
252         recList.AddTail(RecList(IDS_MODSTRETCHNONE)),
253     }
254 }
255 if(IsInList(IDS_METAL))
256 {
257     if(m_stretch)
258     {
259         recList.AddTail(RecList(IDS_RETURN));
260         recList.AddTail(RecList(IDS_RETURN));
261         recList.AddTail(RecList(IDS_MODSTRETCHMETAL));
262     }
263 }
264 if(IsInList(IDS_MICROTEX))
265 {
266 if(IsInList(IDS_QUILTED))
267 {
268 if(IsInList(IDS_SATIN))
269 {
270 if(IsInList(IDS_PIQUE))
271 {
272 if(IsInList(IDS_SILK))
273 {
274 if(IsInList(IDS_BATH))
275 {
276 if(IsInList(IDS_HAND))
277 {
278 if(IsInList(IDS_VELVET))
279 {
280 // Establish thread
281 CString temp;
282 float thread = 4;
283 temp.LoadString(IDS_35WT);
284 if(m_thread == temp) thread = 3.5;
285 temp.LoadString(IDS_30WT);
286 if(m_thread == temp) thread = 3;
287 temp.LoadString(IDS_50WT);
288 if(m_thread == temp) thread = 5;
289 display.thread = thread;
290 // Now analyze the density
291 CString analysis;
292 BEmbroideryFile ft;
```

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```
293 ft = display.file;
294 int w = (int)((float)abs(ft maxX - ft minX)) * thread/11;
295 w = ((w + 1) / 2) * 2; // DWORD align width for storage.
296 int h = (int)((float)abs(ft maxY - ft minY)) * thread/11;
297 ft.width = w;
298 ft.height = h;
299 ft.RenderDensityBitmap();
300 ft.AnalyzeDensity();
301 POSITION pos = ft.densityColorList.GetHeadPosition();
302 CString a = "I have analyzed the density of your design.\r\n", b;
303 int count = 1;
304 float pct = 0;
305 while(pos)
306 {
307     BEmbroideryColor col = ft.densityColorList.GetNext(pos);
308     if(ft.densityMapSum)
309         pct = ((float)col.stitches) / ((float)ft.densityMapSum);
310     b.Format("Density: %i : %6.2f\r\n", count, pct*100);
311     a += b;
312     count++;
313 }
314 analysis = a;
315 rec = analysis;
316 rec += "\r\n\r\n";
317 // Place the recommendation in the box.
318 pos = recList.GetHeadPosition();
319 while(pos)
320 {
321     RecList r = recList.GetNext(pos);
322     rec += r.string;
323     if(pos && ("\r\n" != rec.Right(1))) rec += " ";
324 }
325 m_edit = rec;
326 UpdateData(false);
327 // Reset the display
328 display.Invalidate();
329 }
328 END
```